

WHAT IS SOLAR ACCESS?

Solar access simply means access to sunlight. The purpose of the Solar Access Chapter is to provide protection of a reasonable amount of sunlight from shade from structures and vegetation whenever feasible to all parcels in the City to preserve the economic value of solar radiation falling on structures, investments in solar energy systems, and the options for future uses of solar energy. Additionally, the Oregon Department of Energy has determined that structures receiving full sunlight use up to 20% less energy than those that receive only limited sunlight.

The Solar Access Ordinance is designed to protect solar access from shading by structures and from shading by vegetation.

This guide explains protection of solar access from shading by structures. For protection of solar access from shading by vegetation, see Section 18.4.8.060 Solar Access Permit for Protection from Shading by Vegetation in the Land Use Ordinance.

The goal is to assure that no structure casts a shadow across the northern property line greater than that, which would be cast by a 6 foot tall fence located at the northerly property line. The time of year used to determine the shadow length is during the winter solstice, at 12 noon on December 21. The angle of the sun above the horizon at that time is about 24°.

The following is a step-by-step explanation of how to compute each of the steps necessary to determine the required solar setback for structures (new construction, remodels and additions).

Community Development
Department

51 Winburn Way
Ashland, OR 97520

Phone (541) 488-5305
Fax (541) 552-2050
www.ashland.or.us



Solar Access

Land Use Ordinance 18.4.8



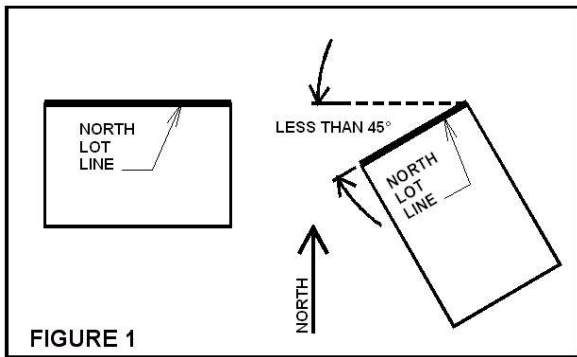
SOLAR SETBACK GUIDE

CALCULATING SOLAR SETBACKS

The following steps should be used when calculating the required solar setback for a structure

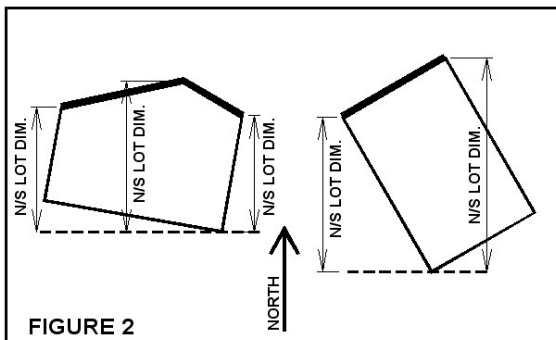
STEP 1 – Determine the Northern Lot Line

- The solar setbacks pertain to the amount of shadow created by a structure at the north lot line.
- The north lot line is any lot line or lines less than 45° southeast or southwest of a line drawn east-west and intersecting the northern most point of the lot.
- If the northern lot line adjoins any unbuildable area (e.g., street, alley, parking lot, common area) other than a required yard area, for purposes of measuring the solar setback, the northern lot line shall be that portion of the northerly edge of the unbuildable area, which is due north of the actual northern edge of the applicant's property. See Figure 1.



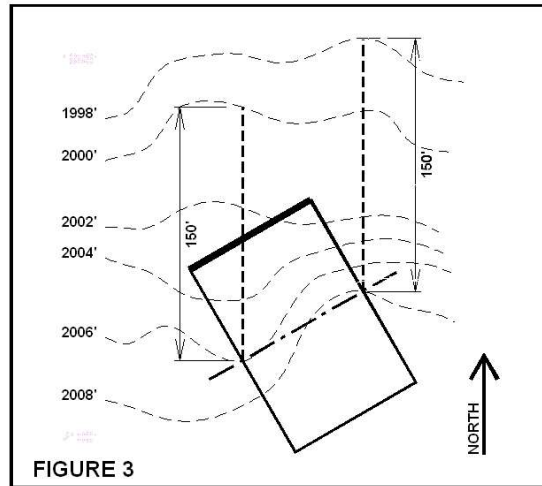
STEP 2 – Determine the North/South Lot Dimension

- The N/S lot dimension is simply the average distance between lines from the corners of the northern lot line south to a line drawn east-west intersecting the southernmost point of the lot. See Figure 2.



STEP 3 - Calculating Average Slope

- Slope is simply defined as the vertical change in elevation divided by the horizontal distance of the vertical change.
- The slope is measured along lines extending 150' from the end points of a line drawn parallel to the north lot line through the mid-point of the north/south lot line. North facing slopes will have **negative values** and south facing slopes will have positive values.
- The slope values calculated are divided by 150; those values are then added together and divided by 2 for the average.



Calculation of average slope (S) example using Figure 3:

$$\begin{aligned} \text{(East)} \quad & 2008-1998= 10 / 150= -.0667 \\ \text{(West)} \quad & 2006-2000= 6 / 150= -.0400 \\ & -.0667 + -.0400 = -.1067/2= -.0534 \end{aligned}$$

Note: The slope is represented as a decimal number as in percent slope.

STEP 4 – Determine Lot Classification

- Lots are classified according to the following formulas:
- Formula I: $30' / (.445 + S)$
- Formula II: $10' / (.445 + S)$

Lots whose N/S lot dimension exceeds that calculated by Formula I shall be required to meet Solar Setback Standard A.

Lots whose N/S lot dimension is less than that calculated by Formula I, but greater than that calculated by Formula II, shall be required to meet Solar Setback Standard B.

STEP 5 – Determination of Shade Producing Point

- The angle or the pitch of the roof determines where the Height of the highest shade producing point (H) is located and has a direct effect on the length of the shadow.
- A roof with a pitch of 5 ½ in 12 has an angle of approximately 25 degrees. If the roof pitch is less than 25 degrees the longest shade producing point will be the north wall or eave. If the roof pitch is greater than 25 degrees the shade producing point will be the roof peak.

STEP 6 – Using the Solar Setback

- The Solar Setback is measured along a line parallel to the northern lot line and is the minimum distance that the tallest shade producing point casting the longest shadow to the north is to be setback from the northern lot line.
- The following equations are used in determining the required Solar Setback (SSB):
- H = Height of highest shade producing point
- S = Average Slope of Parcel 150' to north
- .445 = Angle of sun on December 21 at noon
- Setback Standard A:
- $H - 6 / .445 + S = \text{SSB}$
- Setback Standard B:
- $H - 16 / .445 + S = \text{SSB}$

Examples:

Standard A:

$$H = 22' \quad S = -.04\%$$

$$\begin{aligned} 22 - 6 &= 16 \\ (.445 + (-.04)) &= .405 \end{aligned}$$

$$16 / .405 = 39.5' \text{ Setback from N lot line}$$

Standard B:

$$H = 22' \quad S = -.04\%$$

$$\begin{aligned} 22-16 &= 6 \\ (.445 + (-.04)) &= .405 \end{aligned}$$

$$6 / .405 = 14.81' \text{ Setback from N lot line}$$